

It is respectfully submitted that REF1, REF2 and REF3 neither disclose nor suggest a homogeneously broadened gain medium comprising rare-earth doped fiber having a superstructure grating which comprises **a first grating segment and a second grating segment superposed at least in part on the first grating segment** to form a plurality of cavities that are distributed in the gain medium such that, when an energy signal is applied, **different resonant wavelengths resonate in respective ones of the cavities that are separated from one another.**

a) REF1

REF1, as understood by Applicants, relates to a multiple wavelength laser source comprising a plurality of distributed Bragg reflector (DBR) or distributed feedback (DFB) fiber lasers 22A-22D, each of which is formed by a pair of Bragg gratings 12, 13 that define a lasing cavity therebetween (col. 2, lines 28 to 34; col. 4, lines 26 to 39; and Figs. 1A and 3A). It is clear that the two Bragg gratings 12, 13 forming any lasing cavity in REF1 are spaced apart from one another. This spacing of two Bragg gratings 12, 13 is necessary in REF1 to provide a lasing cavity in which a wavelength can resonate. Therefore, REF1 neither discloses nor suggests a superstructure grating which comprises **a first grating segment and a second grating segment superposed at least in part on the first grating segment.**

Since it neither discloses nor suggests a first grating segment and a second grating segment superposed at least in part on the first grating segment, REF1 cannot possibly disclose or suggest such first and second grating segments (which do not even exist in REF1) forming a plurality of cavities that are distributed in the gain medium such that, when an energy signal is applied, **different resonant wavelengths resonate in respective ones of the cavities that are separated from one another.**

b) REF2 & REF3

Turning to REF2, in rejecting dependent claim 6 (which had recited the feature now recited in independent claim 1) specifying that the claimed superstructure grating comprises a first grating segment and a second grating segment superposed at least in part on the first grating segment, the Examiner contends that column 2 on page 1459 of REF2 (which refers to REF3) discloses this feature. The Examiner also contends, in rejecting claim 1, that REF2 discloses a comb filter formed by superimposing two chirped gratings over each other with a slight shift and that "it is inherent that two grating (18 mm long, 2nd of 2nd col.) superimposed on each other with a slight shift (4 mm) written in erbium doped optical fiber would form a plurality of separate cavities resonating at different wavelength when pumped by an energy signal."

However, contrary to the Examiner's contention, it is not at all "inherent" that REF2's two superimposed chirped gratings "would form a plurality of separate cavities resonating at different wavelength when pumped by an energy signal." On the contrary, superposing two grating segments can result in cavities overlapping with one another to such an extent that no two wavelengths can resonate in cavities that are separated from one another.

To be specific, REF2 in no way mentions or suggests carefully selecting design parameters of its comb filter's two superimposed chirped gratings in order to form cavities separated from one another in which can resonate different wavelengths. Without such careful selection, REF2's two superimposed chirped gratings can in fact result in cavities overlapping with one another to such an extent that no two wavelengths can resonate in cavities that are separated from one another. As noted in the Manual of Patent Examining Procedure, "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic" and, therefore, the

Examiner must provide a rationale or evidence to support a contention of inherency. The Examiner has failed to do so in this case. It is thus respectfully submitted that the Examiner cannot maintain the contention that it is "inherent" that REF2's two superimposed chirped gratings "would form a plurality of separate cavities resonating at different wavelength when pumped by an energy signal" without withdrawing the finality of the last Office Action and providing adequate rationale or evidence in a new non-final Office Action.

As a further demonstration of REF2's lack of careful designing of its two superimposed chirped gratings in order to form cavities separated from one another in which can resonate different wavelengths, the improper spatial separation of the cavities results in unwanted gain competition in REF2's gain medium. In fact, as pointed out in the response to the previous Office Action, in order to reduce cross-gain saturation in the gain medium owing to the improper spatial separation of the cavities, the fundamental operating principle of REF2's laser is to temporally spread pulses at different wavelengths such that the pulses go through the gain medium at different times (page 1459, paragraphs 3 and 4). In other words, not only does REF2's lack of careful designing of its two superimposed chirped gratings in order to form cavities separated from one another in which can resonate different wavelengths result in improperly spaced overlapping cavities leading to cross-gain saturation in its gain medium, REF2's whole point is to pass pulses at different wavelengths at different times through its gain medium in order to counter this unwanted cross-gain saturation. Therefore, as it provides this temporal pulse spreading solution to counter unwanted cross-gain saturation in its gain medium, REF2 need not and (unsurprisingly) does not consider designing its two superimposed chirped gratings to form cavities separated from one another in which can resonate different wavelengths.

Accordingly, REF2 (referring to REF3) neither discloses nor suggests **a first grating**

segment and a second grating segment superposed at least in part on the first grating segment to form a plurality of cavities that are distributed such that, when an energy signal is applied, **different resonant wavelengths resonate in respective ones of the cavities that are separated from one another.**

Since neither REF1 nor REF2 (referring to REF3) discloses or suggests a first grating segment and a second grating segment superposed at least in part on the first grating segment to form a plurality of cavities that are distributed such that different resonant wavelengths resonate in respective ones of the cavities that are separated from one another when an energy signal is applied, it is clear that a substantial difference exists between the cited art and the claimed invention, which precludes a finding of obviousness in respect of claims 1, 22, and 32. The Examiner is therefore respectfully requested to withdraw the rejection of claims 1, 22 and 32, which are believed to be allowable.

Turning now to the Examiner's contention (see the paragraph bridging pages 3 and 4 of the Office Action) that "[i]t would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of REF2 into the device of REF1 by using superimposed chirped gratings instead of grating pairs for at least the purpose of producing a compact multi-wavelength laser," Applicants respectfully disagree and submit that the Examiner's contention is inconsequential and fails to support an obviousness rejection. Specifically, even if an ordinarily skilled person would incorporate the teachings of REF2 into REF1's laser source, he or she would come no closer to the claimed invention. Rather, if an ordinarily skilled person would replace each pair of Bragg gratings forming a respective one of REF1's fiber lasers 22A-22D by a respective set of two superposed chirped gratings as taught by REF2 (as the Examiner contends), every set of two superposed chirped gratings in the resulting laser source would exhibit the same improperly spaced overlapping

cavities leading to cross-gain saturation as described above since (in view of REF2's deficient teachings in this regard) it would not be designed to form cavities separated from one another in which can resonate different wavelengths. As a result, the resulting laser source would not embody the claimed invention.

In view of the foregoing, it is apparent that REF1, REF2 and REF3, taken separately or in combination, fail to disclose or suggest at least one feature of each of claims 1, 22, and 32, thus precluding an obviousness rejection of these claims. The Examiner is therefore respectfully requested to withdraw the rejection of claims 1, 22, and 32, which are believed to be allowable.

Each of dependent claims 2, 3, 7-9, 15, 17-20, 28-31, 33, 34, 37, 39, 40, 44, 45, 49, 50, 53-55, 57, 58, 60, 61, 63, and 64 depends on one of claims 1, 22, and 32 and thus incorporates by reference all the features of its base claim. As such, the Examiner is respectfully requested to withdraw the rejection of these dependent claims, which are believed to be allowable.

2. Rejection of Claim 21 under 35 USC 103

On page 6 of the Final Office Action, the Examiner rejects claim 21 under 35 USC 103(a) as being unpatentable over REF1 and REF2 and further in view of U.S. Patent Application Publication 2004/0037505 by Morin et al. (hereinafter referred to as "Morin"). According to the Examiner, Morin discloses writing a superstructure grating in a waveguide cladding.

Dependent claim 21 depends on claim 1 and thus incorporates by reference all the features of this base claim. If Moring adds nothing more than the teaching of writing a superstructure grating in a waveguide cladding, then it follows that Morin fails to overcome

the deficiencies of REF1 and REF2, as discussed above in section 1.

Therefore, the Examiner is respectfully requested to withdraw the rejection of claim 21, which is believed to be allowable.

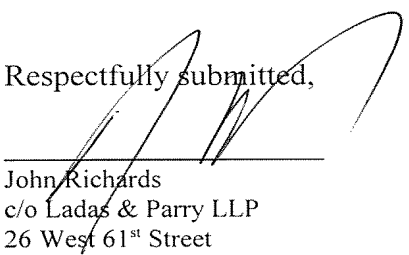
CONCLUSION

Claims 1-3, 7-9, 15, 17-22, 28-34, 37, 39, 40, 44, 45, 49, 50, 53-55, 57, 58, 60, 61, 63, and 64 are believed to be allowable. Favorable reconsideration is requested. In addition, rejoinder of withdrawn claims 4, 5, 10-14, 35, and 36, which are also believed to be allowable, is respectfully requested upon allowance of the generic claims presently in the application. Allowance of the application is earnestly solicited.

This Amendment After Final Rejection is believed clearly to place this application in condition for allowance and its entry is therefore believed proper under 37 C.F.R. §§ 1.116. Accordingly, entry of this Amendment After Final Rejection, as an earnest effort to advance prosecution and reduce the number of issues, is respectfully requested.

If the claims of the application are not considered to be in full condition for allowance, for any reason, Applicants respectfully request the constructive assistance and suggestions of the Examiner in drafting one or more acceptable claims pursuant to M.P.E.P. 707.07(j) or in making constructive suggestions pursuant to M.P.E.P. 706.03 so that the application can be placed in allowable condition as soon as possible and without the need for further proceedings. Applicant's representative can be reached at the telephone number below.

Respectfully submitted,



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